Global Hydrology Resource Center

Data User Guide

Mission Reports IMPACTS

Introduction

The Mission Reports IMPACTS dataset consists of flight plans, plans of the day, science plans, and science summaries logged by scientists during the Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS) field campaign. IMPACTS was a three-year sequence of winter season deployments conducted to study snowstorms over the U.S Atlantic Coast (2020-2022). The campaign aimed to (1) Provide observations critical to understanding the mechanisms of snowband formation, organization, and evolution; (2) Examine how the microphysical characteristics and likely growth mechanisms of snow particles vary across snowbands; and (3) Improve snowfall remote sensing interpretation and modeling to significantly advance prediction capabilities. The mission reports are available from January 17 through March 1, 2020 in PDF format. It should be noted that this dataset will be updated in subsequent years of the IMPACTS campaign.

Citation

McMurdie, Lynn. 2020. Mission Reports IMPACTS [indicate subset used]. Dataset available online from the NASA Global Hydrology Resource Center DAAC, Huntsville, Alabama, U.S.A. doi: http://dx.doi.org/10.5067/IMPACTS/REPORTS/DATA101

Keywords:

NASA, GHRC, NOAA, IMPACTS, ER-2, P-3, mission reports, flight plan reports, plan of the day reports, science plan reports, science summary reports

Campaign

The Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS), funded by NASA's Earth Venture program, is the first comprehensive study of East Coast snowstorms in 30 years. IMPACTS will fly a complementary suite of remote sensing and in-situ instruments for three 6-week deployments (2020-2022) on NASA's ER-2 high-altitude aircraft and P-3 cloud-sampling aircraft. The first deployment began on January 17, 2020 and ended on March 1, 2020.

IMPACTS samples U.S. East Coast winter storms using advanced radar, LiDAR, and microwave radiometer remote sensing instruments on the ER-2 and state-of-the-art microphysics probes and dropsonde capabilities on the P-3, augmented by ground-based radar and rawinsonde data, multiple NASA and NOAA satellites (including GPM, GOES-16, and other polar orbiting satellite systems), and computer simulations. IMPACTS addressed three specific objectives: (1) Provide observations critical to understanding the mechanisms of snowband formation, organization, and evolution; (2) Examine how the microphysical characteristics and likely growth mechanisms of snow particles vary across snowbands; and (3) Improve snowfall remote sensing interpretation and modeling to significantly advance prediction capabilities. More information is available from NASA's Earth Science Project Office's IMPACTS field campaign webpage.

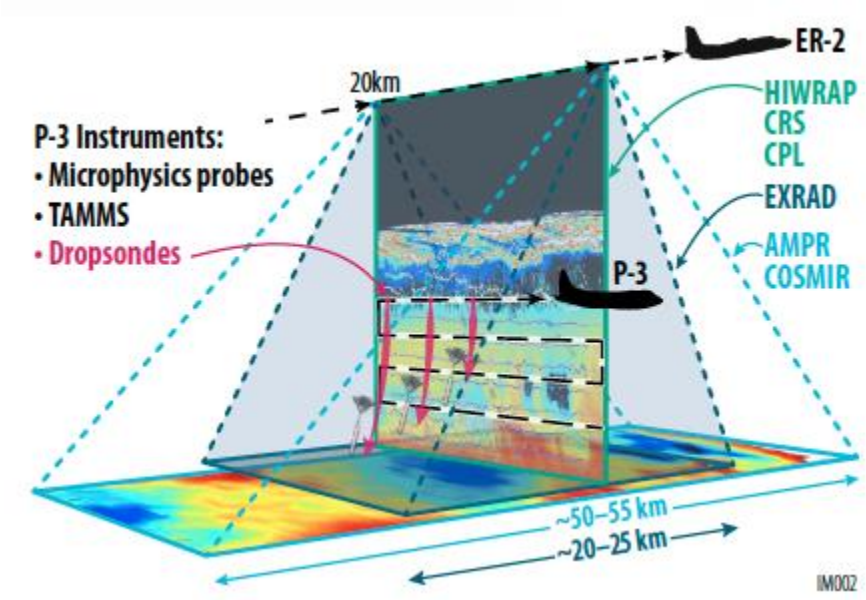

Figure 1: The IMPACTS airborne instrument suite
(Image source: NASA IMPACTS ESPO)

Investigators

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Data Characteristics

The Mission Reports IMPACTS dataset consists of flight plan, plan of the day, science plan, and science summary reports logged during the IMPACTS field campaign. These reports are stored in PDF format and are considered to be at a Level 0 processing level. More information about the NASA data processing levels are available on the EOSDIS Data Processing Levels webpage. The characteristics of this dataset are listed in Table 1 below.

Table 1: Data Characteristics

Characteristic	Description
Platform	NASA Earth Resources 2 (ER-2) research aircraft NASA P-3 Orion (P-3) research aircraft
Instrument	Visual Observations
Spatial Coverage	N: 45.0 , S: 35.0, E: -66.0, W: -81.0 (U.S. East Coast)
Temporal Coverage	January 17, 2020 - March 01, 2020
Temporal Resolution	Daily -< Weekly
Parameter	Flight plan, plan of the day, science plan, science summary
Version	1
Processing Level	0

File Naming Convention

The Mission Reports IMPACTS dataset files are available in PDF format and named using the following convention:

Flight Plan files:
IMPACTS_flightPlan_YYYYMMDD.pdf

Plan of the Day files:
IMPACTS_planOfTheDay_YYYYMMDD.pdf

Science Plan files:
IMPACTS_sciencePlan_YYYYMMDD.pdf

Science Summary files:
IMPACTS_scienceSummary_YYYYMMDD.pdf

Table 2: File naming convention variables

Variable	Description
YYYY	Four-digit year
MM	Two-digit month
DD	Two-digit day
.pdf	Portable Document Format (PDF)

Data Format and Parameters

The Mission Reports IMPACTS dataset consists of flight plan, plan of the day, science plan, and science summary reports in PDF format. Each report type is described in more detail below.

Flight Plan reports

The flight plan files include plots of ER-2 and P-3 flight tracks during the campaign, as well as summaries of the target precipitation events, event forecasts, science objectives, detailed descriptions of the flight paths (e.g. take off and landing times, landing locations, altitudes), and other related information.

Plan of the Day reports
The plan of the day files include daily schedules for the IMPACTS campaign overall, the P-3 Wallops Flight Facility (WFF) site, and the ER-2 Hunter Air Force Base site. The reports include information for the current day (date in the filename) and the following day(s). Telecon briefing schedules are also included.

Science Plan reports
The science plan files contain daily science plans for Day 0 (date in filename) through Day 5, including flight schedules, designated "No fly" days, event forecast summaries, sounding launches, and other related information.

Science Summary reports
The science summary files consist of overall summaries of the campaign missions. The reports include an overview of the target precipitation systems, aircraft and instrument operations, and resulting imagery (e.g. satellite imagery, sounding plots, radar images, precipitation particle images) captured during the events.

Software
No special software is required to read the PDF mission report files.

Known Issues or Missing Data
There are no known issues with these data or any known gaps in the dataset.

References
NASA ESPO. (2020). IMPACTS.
https://espo.nasa.gov/impacts/content/IMPACTS

Related Data
All data collected during the IMPACTS field campaign are considered to be related. These data can be located by searching the term 'IMPACTS' using the GHRC HyDRO 2.0 data search tool.

Contact Information
To order these data or for further information, please contact:

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